Remarks

The above Amendments and these Remarks are in reply to the Office action mailed October 17, 2005. Claims 18, 23-24 and 30 have previously been withdrawn from consideration. Claims 1-17, 19-22 and 25-29 are presented herewith for consideration.

I. Objection to Specification

The specification is objected to under 35 U.S.C. §112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure. Applicant respectfully traverses the objection as follows.

In general, the Examiner in the February 17, 2005 Office action, and in the October 17, 2005 Office action (by incorporation) argue two points at length.

First, it is pointed out that conventional attempts at cold fusion have failed. Roughly 40 pages of the February 17, 2005 Office action are devoted to showing that conventional attempts at cold fusion have failed and have been discredited.

Second, given the history of failure in cold fusion, the Examiner then argues that skilled artisans would not understand how to make and use the invention disclosed and claimed in the application.

Applicant respectfully disagrees on the ground that the prior art attempts at cold fusion have fundamentally relied on electrochemical processes. As explained hereinafter, applicant's process is radically different than electrochemical processes. As such, applicant's invention should not be compared in the same light as, or subject to the same prejudices as, prior art attempts at cold fusion. It is respectfully submitted that to do so improper applies a heightened standard of enablement owing to failed traditional electrochemical processes. It is respectfully submitted that, once viewed in its own light, without the penumbra of failure surrounding the prior art, those of skill in the art would understand that the properties of applicant's system which allow the production of heat act predictably and would be understood by one of skill in the art.

As indicated above, prior art attempts at cold fusion have relied on electrochemical processes. With electrochemical processes, a metal lattice is loaded with deuterium ions. The loading process occurs where deuterium atoms are attracted to the surface of a cathode. Palladium is the preferred cathode as explained below. Once on the surface of the metal lattice, deuterium ions migrate or diffuse into the lattice, where they

mix with the free-flowing palladium electrons. Palladium is a good working material because it attracts some measure of deuterium ions into the lattice. However, the palladium is also a limiting factor (albeit better than any other known metals). The loading of palladium with deuterium ions by the diffusion mechanism occurring in all electrochemical processes does not take place at a high rate. It is very difficult to even approach a 1 to 1 ratio (of deuterium ions to palladium atoms). Advanced loading techniques, taking place over the course of literally months, have achieved loading densities on the order of 5 to 1. There is also a problem in that as deuterium ions are diffusing into the palladium, deuterium ions are also diffusing out. This is the reason that it has not been possible to obtain sufficient concentrations of deuterium ions using electrochemical processes to obtain reliable cold fusion.

By contrast, in the present invention, the generation and direction of collapsing cavitation bubbles toward a reactant material such as a metal foil, under the conditions disclosed in the application, results in the collapse and bursting of the bubbles at very high energies at the surface of the metal foil. As the bubble collapses, the temperature and density of the bubble contents increases. Near the end of its adiabatic collapse, a bubble in an acoustic field produces a jet. This jet will accelerate through the bubble and self-destruct in one acoustic cycle. By controlling the bubble formation and direction of the energy, the dissociated bubble contents (deuterium ions) which make up the jet, are accelerated at velocities of several Mach into the surface of the metal foil suspended in the reactor.

This bursting releases tremendous energy which implants the deuterium ions into the metal foil. The process of the present invention results in a concentration of deuterium ions within the metal lattice on the order of 100 times greater than with electrochemical processes, at which densities, the deuterium ions fuse at a much higher concentration than is possible with traditional electrochemical processes. Unlike the slight affinity of palladium for the deuterium ions, the concentrations of deuterium implanted by the present invention are artificially high. As such, the deuterium ions last only for a few picoseconds (where deuterium ions can last for hours or days in electrochemical processes, depending on the conditions). At these durations, measurement becomes difficult. However, that excess heat occurs as a result of this reaction has been confirmed in numerous tests run by applicant.

Based on the fundamental differences between traditional electrochemical processes and applicant's invention, it is respectfully submitted that it is improper to apply the heightened standard associated with failed traditional electrochemical processes. When considered under the standard applied to predictable arts,

it is respectfully submitted that applicant's disclosure satisfies the requirements of the first paragraph of Section 112.

A. Written Description

The Examiner first indicates that disclosure violates §112 under the written description requirement. The written description requirement of §112 ensures that the scope of the invention recited in the claims does not exceed the scope of the invention known to the inventor at the time the original application was filed. *Vas-Cath Inc. v. Mahurkar*, 935 F2d 1555 (Fed. Cir. 1991). This requirement is separate and distinct from the enablement requirement. Enablement speaks to how the claimed invention is described, where the written description requirement looks to what the inventor knew at the time of filing. The test is whether one of ordinary skill in the art would clearly recognize upon reading the disclosure that, at the time of filing, the inventor possessed, or invented, what is claimed. *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989).

Claims filed with the original application constitute their own description and as such are not properly rejected on written description grounds. *In re Koller*, 613 F.2d 819, 823-24 (C.C.P.A. 1980). The claims of the present invention exist in the same or substantially the same form as when they were filed. Therefore, it is respectfully submitted that, at the very least, the claims themselves provide adequate written description to show that the claims do not exceed the scope of the invention known to the inventor at the time the original application was filed. If this rejection is maintained, it is respectfully submitted that the Examiner provide a bases for disregarding Federal Circuit case directly addressing this point which is contrary to the Examiner's position.

B. Enablement

As indicated above, despite the failure shown in electrochemical cold fusion processes, the present invention does not operate by electrochemical processes. The present invention uses cavitation to create and collapse cavitation bubbles at the surface of the catalytic material at tremendous energies. Once of skill in the art would understand upon reading applicant's disclosure how to generate the disclosed cavitation bubbles. The generation of the cavitation bubbles is an electromechanical process. As discussed below, electromechanical processes are known to be predictable and disclosures relating to such processes are broadly enabling.

The purpose of the enablement provision of §112 is to ensure that the inventor provides sufficient disclosure in the specification to allow one of skill in the relevant art to make and use the invention recited in the claims, without undue experimentation, relying on the patent specification and the knowledge in the art at the time the specification was filed. See, e.g., *Scripps Clinic Research Foundation v. Genentech, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991). Enablement is not precluded because some experimentation is necessary to determine how to make and use the invention. The question is whether the necessary experimentation is unduly extensive. While this is a subjective test, the Federal Circuit in *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988) outlined a series of factors which may be used to determine whether experimentation is unduly extensive. The factors include:

1) the breadth of the claims;
2) the nature of the invention;
3) the level of predictability;
4) the amount of direction provided by the inventor in the application;
5) the existence of working examples; and
6) the quantity of experimentation needed relative to the content of the disclosure.

The Examiner's argument focuses on the failure in the prior art to achieve cold fusion and excess heat. The opening paragraph is exemplary of the Examiner's position:

> There is no reputable evidence of record to support any allegations or claims that the invention involves nuclear fusion nor, that any allegations or claims of "excess heat" and of transmutation, are valid and reproducible, nor that the invention as disclosed in capable of operating as indicated and capable of providing a useful output. (Office action, Page 3, paragraph 3).

The Examiner's position must necessarily hinge on the assertion that applicant's invention is the same as the prior art. It would exceed the limits of §112 to say that a given invention is not enabled because other, different systems in the same field have falsely claimed to solve the problem solved by the given invention. Such a position would require that no invention would fulfill the requirements of §112 where similar attempts had failed in the past. In fact, the Supreme Court has made clear that the solution to a long standing problem may be considered patentable especially where others have tried and failed to reach that solution in the past. *Graham v. John Deere*, 383 U.S. 1, 17 (1966). Thus, applicant understands the Examiner's position regarding enablement to turn on its being the same as the prior art.

However, it is respectfully submitted that none of the prior art or literature has contemplated the system used by applicant to obtain excess heat. Therefore, it is respectfully submitted the prior art and literature discussed at length by the Examiner is not probative or determinative of the enablement of the disclosure of the present invention.

Nowhere does §112 require that there be independent verification or substantiation of a disclosure of an invention. That is not the purpose or application of §112. As indicated above, to do so in this case would be to unfairly and improperly judge the present application under the same penumbra of failure associated with prior art electrochemical processes.

However, enablement is instead determined based on whether one of average skill in the art can make and use the invention recited in the claims. Applicant respectfully submits that applicant's disclosure clearly meets this standard with respect to the recited invention. For example, Claim 1 (as amended) recites:

1. An anomalous heat producing apparatus comprising:

a reaction vessel;

a reactant material either in liquid form, dissolved in a liquid or mixed with a liquid, the reactant material selected from the group consisting of hydrogen (H_2), hydrogen oxide (H_2O), deuterium (D_2), deuterium oxide (D_2O), hydrogen deuterium oxide (HDO), or mixtures thereof; linear alkanes, metallic hydrides, paraffins and silicones wherein at least one of the hydrogen atoms is isotopic hydrogen, said reactant material contained in said reaction vessel;

a catalytic material, metal or alloy substrate, a substantial part of which is selected from the group consisting of copper (Cu), nickel (Ni), titanium (Ti), palladium (Pd), or silver (Ag), said catalytic material, metal or alloy also contained in said reaction vessel and for providing a matrix configuration to position atoms of the reactant material in a manner to optimize controlled combination;

an energy source for generating cavitation bubbles within the reactant material and collapsing the bubbles at the catalytic material, collapse of the bubbles at the catalytic material implanting the reactant material within the catalytic material, implantation of the catalytic material generating heat;

and means for conducting away heat from said reaction vessel.

1. Reaction Vessel

In an embodiment, the reaction vessel is shown in Figs. 1 and 2 as reaction containment device 14, which is described in the application at least in part as follows:

> The reaction containment device 14 consists of a reaction volume 18 composed of stainless steel or other appropriate metal which will withstand pressure. This is shown in FIG. 2 as a reaction volume 18 defined by elements 20, 22, 36 and 42. The reaction volume side is formed by the stainless steel containment ring 20 which is sandwiched between the 1/2 inch Al window support 36, which defines a plurality of holes 40, and FEP window 42 (Fluorinated polymers such as FEP (fluoroethylene polymer- or Teflon®-fluorinated polytetrafluoroethylene- hereinafter, such material will be referred to as FEP or Teflon®) and the stainless steel disk 22. Six 1/2 nylon bolts 38 fasten the reaction volume containment to sonication containment with the help of ring clamp 39. The metal plate 22 is electrically isolated by FEP gaskets 108 and can also act as one of two alternating electrically charged plates. The opposite alternatively electrically charged plate 24 is formed of a stainless steel screen so that the circulating D2O 10 is electrically isolated in reactive volume 18 by FEP window 42 and FEP shield 25…
>
> As can be seen in FIG. 1, set 90° to input port 30 in reaction vessel body 20 are two ports 113 and 114 in FIG. 3A, which serves to introduce the electrical connection 32 leading to alternatively electrically charged screen 24 (see FIG. 3a) and to introduce the electrical connection 34 leading to lower alternatively electrically charged plate and insulated separator disk 22.
>
> Closing the top of reaction vessel body 20 is a perforated plate 36 which is affixed, for example, by means of electrically insulating nylon bolts 38 and a ring 39, to reaction vessel body 20. Formed through the plate 36 are a plurality of conically shaped holes 40. The conical shape, as can be seen in FIG. 2, has its apex pointed downwardly or adjacent to a plate 42 which may be transparent to light and in that case 36 provides support for the window 42 allowing for the passage of light and a view of the foil 26. Plate 42 may, for example, be formed plastic, such as Teflon® or FEP, or other material. Use of a stainless steel plate 42 will increase the total cavitation in the reaction vessel because of the reflection of the sonic waves. (Specification, page 6, line 12 – page 8, line 11).

From this disclosure and the remaining disclosure in the application, one of average skill in the art knowledgeable of vessels used for systems as in the present invention would know how to make and use the "reaction vessel" recited in Claim 1 and claims dependent thereon with little or no experimentation.

2. Reactant Materials

Claim 1 further recites:

> a reactant material either in liquid form, dissolved in a liquid or mixed with a liquid, the reactant material selected from the group consisting of hydrogen (H_2), hydrogen oxide (H_2O), deuterium (D_2), deuterium oxide (D_2O), hydrogen deuterium oxide (HDO), or mixtures thereof; linear alkanes, metallic hydrides, paraffins and silicones wherein at least one of the hydrogen atoms is isotopic hydrogen, said reactant material contained in said reaction vessel.

All of these reactants are well known in the art, and one of average skill in the art would clearly understand how to make and use these reactant materials. Further understanding of these reactant materials is found in the specification:

> Circulated through the volume 18 is a mixture preferably of deuteriumoxide (D_2O). Other materials which may be used to circulate through the volume include hydrogen (H_2), hydrogen oxide (H_2O), deuterium (D_2), hydrogen deuteriumoxide (HDO) or mixtures thereof either in a gaseous or liquid form or other deuterated liquids, and other metal alloys and complexes. Such other deuterated liquids for cold systems may include liquid deuterium, liquid deuterated methane, ethane, and other linear alkanes, and liquid metallic hydrides where the hydrogen atom or atoms is replaced by the hydrogen isotope deuterium. For hot systems, other deuterated liquids may include liquid paraffins, liquid silicones and liquid metallic hydrides having relatively high melting points, again where at least one hydrogen atom is isotopic hydrogen. This material is introduced into the reaction chamber by means of conduit 71 and removed from reaction chamber 18 by conduit 72. (Specification, page 7 line 13 – line 24).

From this disclosure and the remaining disclosure in the application, one of average skill in the art knowledgeable of reactant materials used for systems as in the present invention would know how to make and use the "reactant material" recited in Claim 1 and claims dependent thereon with little or no experimentation.

3. Catalytic Material

Claim 1 further recites:

> a catalytic material, metal or alloy substrate, a substantial part of which is selected from the group consisting of copper (Cu), nickel (Ni), titanium (Ti), palladium (Pd), or silver (Ag), said catalytic material, metal or alloy also contained in said reaction vessel and for providing a matrix configuration to position atoms of the reactant material in a manner to optimize controlled combination.

All of these materials are well known in the art, and one of average skill in the art would clearly understand how to make and use these materials. Further understanding of these catalytic materials is found in the specification:

> Positioned between the charged plate 22 and a charged screen 24 is a metal foil lattice matrix 26. The metal foil is held in place in the reaction volume 26 by metal foil holder 27. In the mechanism that will be discussed, the metal foils can form hydrides that range from transient to permanent hydrides. This includes all metals in the periodic table. Metals that have been successfully tried are copper (Cu), nickel (Ni), titanium (Ti), palladium (Pd), silver (Ag)… Preferably, this metal is in the form of a foil, but it may take other forms such as particles, a grid or screen, a "wool" like structure, or a thin film or plated material.

From this disclosure and the remaining disclosure in the application, one of average skill in the art knowledgeable of catalytic materials would know how to make and use the “catalytic material” recited in Claim 1 and claims dependent thereon with little or no experimentation.

3. Energy Source

Claim 1 further recites, “an energy source to excite said reactant material.” Energy sources for use in the present invention are known in the art and it would be readily appreciated by one of skill in the art how to make and use such an energy source. Additionally, an energy source as recited is disclosed in the specification as follows:

> The creation of transient cavitation bubbles can be done in one of several mechanical methods. The use of a piezo device to drive acoustic horn 12 is an efficient method for generating acoustic field in H2O as shown in FIG. 1. The sonication volume 81 is pressurized with N2 in bubbler containment 66 to suppress the formation of cavitation bubbles but allows for the acoustic energy transport through the stainless steel disk 22 separating 81 from the reaction volume 18. Separation of the sonicator from the reaction volume 14 is necessary when the sonicator horn 12 can be adversely affected by solubilized deuterium gas and transient cavitation bubbles. This is particularly true with titanium immersed in water with hydrogen or hydrogen isotopes which readily form hydrides.
>
> Another way to create transient cavitation bubbles would be to use a jet, venturi tube, mechanical or porous device relying on a flow-through pressure differential to create the bubbles. There are also natural ways to create transient cavitation bubbles such as stirring, dropping, or shaking the material contained in the reaction chamber 14. Upon collapse of the transient cavitation bubbles, extremely high temperatures and pressures and energy densities may be formed at a metal surface. More will be said about this in the ensuing discussion. There are other ways to impart high energy densities to metal surfaces such as by using

micro-explosive, electric, or laser techniques. (Specification, page 5, line 19 – page 6, line 11).

And further at page 9, line 22 – page 10, line 8:

> The acoustic generator in the preferred embodiment is a sonicator made by Heat Systems, 1938 New Highway, Farmingdale, N.Y. 11735, Model No. 475. This particular model number drives a 2.5" titanium horn at 20 KHz.
>
> The two charged surfaces stainless steel plate screen 22 and 24 may be supplied by an alternating electric field from a signal generator 82 supplied by Viz 335 East Price Street, Philadelphia, Pa. 19144. It is pointed out that the frequency selection for both the current in the plate and screen circuit just described and the sound frequency in the sonicator are not necessarily limited to the 20 Khz range, nor is it necessary that the frequencies should be the same or synchronized. Accordingly, other frequencies for both the charged plate and screen feature herein and also the sonicator frequency could be used equally as well.

From this disclosure and the remaining disclosure in the application, one of average skill in the art knowledgeable of energy sources would know how to make and use the "energy source" recited in Claim 1 and claims dependent thereon with little or no experimentation.

5. Means for Conducting Away Heat

Claim 1 further recites, "means for conducting away heat from said reaction vessel." This claim limitation is discussed in the Specification at least at page 9, lines 13 – 22:

> Referring again to FIG. 1, there also exists a second fluid source 11 to provide a cooling for the acoustic horn 12. Cooling coil 79 may be positioned in a heat exchanger 165. A bubbler for the H_2O system 167 is pressurized with nitrogen. The addition of N.sub.2 is accomplished by opening valve 69 changing the pressure over the H_2O in fluid source or cooling liquid 11. The flow meter 67 measures the flow rate of H_2O through the bubbler 167 and the sonication volume system 16. This pressurized system regulates the pressure in the circulating cooling liquid 11 and the pump 75 regulates the flow. The sonication volume system 16 that contains the liquid 11 is a vacuum tight system. The cooling liquid 11 is circulated through input conduit 78, through horn 12 and into the chamber 81 containing the acoustic horn device 12 by means of a circulating pump 75 and withdrawn through an outlet conduit 74.

From this disclosure and the remaining disclosure in the application, one of average skill in the art knowledgeable of means for conducting away heat would know how to make and use the "means for conducting away heat" recited in Claim 1 and claims dependent thereon with little or no experimentation.

As described above, one of average skill in the art would know how to make and use the invention

recited in Claim 1, as well as claims dependent thereon. The same reasoning applies to independent Claim 25 and claims dependent thereon. The application describes in detail how the above-described elements may be used to produce heat as recited in the claims. For example, the application states:

> In the light of successful generation of excess heat from these metals the different lattice structures of the metal do not play an important part. The reason is the collapsing bubble is a momentary self-contained micro particle accelerator. The bubbles that collapse randomly by way of a jet mechanism at the foil surface inject a plasma produced from the dissociated bubble contents into the metal lattice. This momentary injection of particles into the metal produces a high local concentration of hydrogen ions in the metal lattice thus a local stable or unstable hydride. (Specification, page 7, lines 4 – 10).

The Examiner does not show how one of skill in the art would not know how to build a system for producing heat according to the disclosure, but rather relies on the fact that past references and publications have failed to enable one of skill in the art to produce cold fusion or excess heat. However, it is respectfully submitted that, given the disclosure of the present invention, one of skill in the art would know how to make and use a system for producing heat. The Examiner also indicates that one of average skill in the art would not know how to make a cavitation bubble that collapses as disclosed. However, applicant respectfully submits that such a collapsing cavitation bubble would result from the disclosed set up and operation of the recited invention.

Based on the above, it is respectfully submitted that the disclosure does provide adequate written description and enabling disclosure to support the claimed invention.

II. Rejection of Claims 1-17, 19-22 and 25-29 Under 35 U.S.C. §112

Claims 1-17, 19-22 and 25-29 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement as set forth in the 2/17/2005 Office action and section 2 of this Office Action.

Applicants respectfully traverse the rejection for the reasons set forth above with respect to the objection to the specification.

III. Rejection of Claims 1-17, 19-22 and 25-29 Under 35 U.S.C. §112

Claims 1-17, 19-22 and 25-29 are rejected under 35 U.S.C. §112, first paragraph, because the best mode contemplated by the inventor has not been disclosed, as set forth in section 7 of the 2/17/2005 Office Action. Applicants respectfully traverse the rejection as follows.

In order to support a §112 rejection based on a failure to disclose the best mode, the Examiner must demonstrate that: 1) the inventor knew of a best mode of practicing the invention, and 2) the inventor concealed the best mode by not disclosing it in the specification. *Minco, Inc. v. Combustion Engineering, Inc.*, 95 F.3d 1109 (Fed. Cir. 1996). In all of the Examiner's statement regarding features of the present invention that were not disclosed, the Examiner has made no showing of any concealment by the applicant. Without such a showing, applicant respectfully submits that the best mode requirement is not violated. It is therefore respectfully requested that the rejection based on best mode be withdrawn.

IV. Rejection of Claims 1-17, 19-22 and 25-29 Under 35 U.S.C. §112

Claims 1-17, 19-22 and 25-29 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

Applicants respectfully traverse the rejection for the reasons set forth above with respect to the objection to the specification.

V. Rejection of Claims 1-17, 19-22 and 25-29 Under 35 U.S.C. §112

Claims 1-17, 19-22 and 25-29 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While there is no bright-line test for definiteness, the Federal Circuit has laid down a framework:

> The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification. . . . If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, §112 demands no more. . . . The degree of precision necessary for adequate claims is a function of the nature of the subject matter.

Miles Laboratories, Inc. v. Shandon Inc., 997 F.2d 870 (Fed. Cir. 1993), *cert. denied*, 510 U.S. 1100 (1994). It is clear from this holding and others that maximum precision is not required. *See, PPG Indus. V. Guardian Indus. Corp.*, 156 F.3d 1351 (Fed. Cir. 1998) ("Claims are often drafted using terminology that is

not as precise or specific as it might be); 3 D. Chisum, *Chisum on Patents*, §8.03[3][c], n. 27, 2001 Cum. Supp. (2001).

Moreover, the Federal Circuit has confirmed that the use of qualitative and relative terms, such as "about," "substantially," "essentially," to qualify claimed elements may be definite under §112, second paragraph. The test is whether one of average skill in the art, either from reading the written description, prosecution history or from a knowledge of the art in general, would understand the meaning of the term and could ascribe general upper and lower limits. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 1217-18 (Fed. Cir. 1991); *Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545 (Fed. Cir. 1996) ("relatively small" hydraulic diameter not indefinite); *Rosemount, Inc. v. Beckman Instruments, Inc.*, 727 F.2d 1540 (Fed. Cir. 1984) ("close proximity" not indefinite).

With regard to the specific rejections under §112, second paragraph, applicant has amended the claims to remove the terms "substantial," "controlled," and "thin." However, it is respectfully submitted that one of skill in the art would understand the metes and bounds of Claim 1 including the phrase "for providing a matrix configuration to position atoms of the reactant material in a manner to optimize combination," and Claim 11 including the phrase "wherein the energy source is focused sonic waves of sufficient energy to cause cavitation bubbles to form in the liquid reactant material."

The Examiner's has further rejected certain claims for the use of "wherein" clauses on the grounds that, "the content of [such limitations] does not inherently result from the actual structure recited." It is respectfully submitted that nowhere does §112, second paragraph, allow the use of wherein clauses only where the content of such clauses inherently results from the actual structure recited. It is axiomatic that applicant may be his or her own lexicographer, and there is no prohibition under §112, second paragraph, against the use of wherein clauses.

Based on the above, it is respectfully requested that the rejection of the claims under §112, second paragraph be withdrawn.

VI. <u>Rejection of Claims 1-17, 19-22 and 25-29 Under 35 U.S.C. §101</u>

Claims 1-17, 19-22 and 25-29 are rejected under 35 U.S.C. §101 because the claimed invention is not supported by a credible asserted utility as set forth above and in the 2/17/2005 Office Action.

Applicants respectfully traverse the rejection for the reasons set forth above with respect to the objection to the specification. Namely, despite the failings of the prior art to reliably reproduce excess heat

discussed extensively in the Office action, a system as disclosed in the present invention does reliably produce excess heat. The reliable production of heat is a utilitarian result.

VII. Rejection of Claims 25, 26 and 29 Under 35 U.S.C. §102(b)

Claims 25, 26 and 29 are rejected under 35 U.S.C. §102(b) as being clearly anticipated by U.S. Patent No. 4,333,796 (*Flynn*) as set forth in the 2/17/2005 Office Action.

Flynn is based on the cavitation of liquid metal deuterium producing the hot fusion products of He3 and T. The device of Flynn uses six acoustic horns focused at the center of the reactor to cavitate liquid metal or metal hydride at high temperature and pressurized with the addition of D2 gas to produce fusion energy. There is emphasis on the symmetry of the bubble and its collapse and the effects of gravity. The heat generation comes from the two DD hot fusion channels one producing helium 3 the other tritium.

By contrast, the system of the present is unique featuring the use of pure resonant cavitation of a liquid with no addition of an ionic dissolved salt with a metal foil target (target for the high velocity jet plasma implantation). The mechanism which involves the bubble collapse via the z pinch of the jet plasma (with a life time of pico seconds) which implants D+ plasma at high densities providing an environment for deuterium fusion in the foil. The z pinch is created by the high velocity electrons from the high density plasma jet that are drawn to the center of the jet by the pinching magnetic field produced by these high velocity electrons. They squeeze the jet with its deuterons as it implants them into the lattice. These features are nowhere disclosed, taught or suggested in Flynn.

Based on the above, it is respectfully requested that the rejection of the claims over Flynn be withdrawn.

VIII. Rejection of Claims 1-8, 10, 11, 15-17, 19, 21, 22 and 25-29 Under 35 U.S.C. §102(b)

Claims 1-8, 10, 11, 15-17, 19, 21, 22 and 25-29 are rejected under 35 U.S.C. §102(b) as being clearly anticipated by Japanese Document No. 367196 (*Fujimura*), as set forth in the 2/17/2005 Office Action.

Fugimura discloses an electrochemical reaction and deals with the electrolysis of D2O in electrolytic solution. The reference discloses a fusion electrolytic device where electrolysis occurs via a DC current passing through electrodes in an ionic solution. One of the electrodes, the Pd cathode, becomes the source of the acoustic waves or input as it is fastened to an oscillating magnetostrictive device. The geometry is such that a standing wave of 100KHz is maintained between the two electrodes. Over the D2O in the reactor a

pressure of D2 gas of several atmospheres provides more hydrogen to the surface of the Pd cathode which adds to the electrochemical hydrogen produced by the electrolysis also at the surface of the Pd. The acoustic waves delivered to the cathode increase the efficiency of the fusion.

By contrast, the present invention does not operate by an electrolytic device. The energy source recited in the present invention operates by cavitation, which is not disclosed, taught or suggested in Fugimura.

Based on the above, it is respectfully requested that the rejection of the claims over Fugimura be withdrawn.

IX. Rejection of Claims 1-17, 19-22 and 25-29 Under 35 U.S.C. §103(a)

Claims 1-17, 19-22 and 25-29 are rejected under 35 U.S.C. §103(a) as being unpatentable over any of Japanese Document No. 2281185 (*Sugano*), Japanese Document No. 3053195 (*Kasahara*), or U.S. Patent No. 4,968,395 (*Pavelle*), alone, or in view of either Publication No. WO 9202020 (*Liebert*) or Publication No. WO 9118396 (*Drexler*) as set forth in the 2/17/2005 Office action.

Again, each of these references operates by electrolytic processes. These references do not disclose, teach or suggest a system that operates by cavitation and collapsing cavitation bubbles.

Based on the above, it is respectfully requested that the rejection of the claims over the cited references be withdrawn.

Based on the above remarks, reconsideration of Claims 1-17, 19-22 and 25-29 is respectfully requested.

The Examiner's prompt attention to this matter is greatly appreciated. Should further questions remain, the Examiner is invited to contact the undersigned attorney by telephone.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

Date: November 20, 2006

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